

SEQUENCE LISTING

<110> Croce, Carlo
Brenner, Charles
Pekarski, Yuri

<120> CRYSTAL STRUCTURE OF WORM NitFhit
REVEALS THAT A Nit TETRAMER BINDS TWO Fhit DIMERS

<130> CRO01.NP007

<150> 60/204,713

<151> 2000-05-16

<160> 11

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 276

<212> PRT

<213> Homo sapien

<400> 1

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Thr Gln Gly Ala Lys Ile Val Ser Leu Pro Glu Cys Phe Asn Ser Pro
          35          40          45
Tyr Gly Ala Lys Tyr Phe Pro Glu Tyr Ala Glu Lys Ile Pro Gly Glu
          50          55          60
Ser Thr Gln Lys Leu Ser Glu Val Ala Lys Glu Cys Ser Ile Tyr Leu
          65          70          75          80
Ile Gly Gly Ser Ile Pro Glu Glu Asp Ala Gly Lys Leu Tyr Asn Thr
          85          90          95
Cys Ala Val Phe Gly Pro Asp Gly Thr Leu Leu Ala Lys Tyr Arg Lys
          100          105          110
Ile His Leu Phe Asp Ile Asp Val Pro Gly Lys Ile Thr Phe Gln Glu
          115          120          125
Ser Lys Thr Leu Ser Pro Gly Asp Ser Phe Ser Thr Phe Asp Thr Pro
          130          135          140
Tyr Cys Arg Val Gly Leu Gly Ile Cys Tyr Asp Met Arg Phe Ala Glu
          145          150          155          160
Leu Ala Gln Ile Tyr Ala Gln Arg Gly Cys Gln Leu Leu Val Tyr Pro
          165          170          175
Gly Ala Phe Asn Leu Thr Thr Gly Pro Ala His Trp Glu Leu Leu Gln
          180          185          190
Arg Ser Arg Ala Val Asp Asn Gln Val Tyr Val Ala Thr Ala Ser Pro
          195          200          205
Ala Arg Asp Asp Lys Ala Ser Tyr Val Ala Trp Gly His Ser Thr Val

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210	215	220
Val Asn Pro Trp Gly Glu Val Leu Ala Lys Ala Gly Thr Glu Glu Ala		
225	230	235
Ile Val Tyr Ser Asp Ile Asp Leu Lys Lys Leu Ala Glu Ile Arg Gln		
	245	250
Gln Ile Pro Val Phe Arg Gln Lys Arg Ser Asp Leu Tyr Ala Val Glu		
	260	265
Met Lys Lys Pro		
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 <213> mouse

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Lys Gln Gly Ala Asn Ile Val Ser Leu Pro Glu Cys Phe Asn Ser Pro
35 40 45
Tyr Gly Thr Thr Tyr Phe Pro Asp Tyr Ala Glu Lys Ile Pro Gly Glu
50 55 60
Ser Thr Gln Lys Leu Ser Glu Val Ala Lys Glu Ser Ser Ile Tyr Leu
65 70 75 80
Ile Gly Gly Ser Ile Pro Glu Glu Asp Ala Gly Lys Leu Tyr Asn Thr
85 90 95
Cys Ser Val Phe Gly Pro Asp Gly Ser Leu Leu Val Lys His Arg Lys
100 105 110
Ile His Leu Phe Asp Ile Asp Val Pro Gly Lys Ile Thr Phe Gln Glu
115 120 125
Ser Lys Thr Leu Ser Pro Gly Asp Ser Phe Ser Thr Phe Asp Thr Pro
130 135 140
Tyr Cys Lys Val Gly Leu Gly Ile Cys Tyr Asp Met Arg Phe Ala Glu
145 150 155 160
Leu Ala Gln Ile Tyr Ala Gln Arg Gly Cys Gln Leu Leu Val Tyr Pro
165 170 175
Gly Ala Phe Asn Leu Thr Thr Gly Pro Ala His Trp Glu Leu Leu Gln
180 185 190
Arg Ala Arg Ala Val Asp Asn Gln Val Tyr Val Ala Thr Ala Ser Pro
195 200 205
Ala Arg Asp Asp Lys Ala Ser Tyr Val Ala Trp Gly His Ser Thr Val
210 215 220
Val Asp Pro Trp Gly Gln Val Leu Thr Lys Ala Gly Thr Glu Glu Thr
225 230 235 240
Ile Leu Tyr Ser Asp Ile Asp Leu Lys Lys Leu Ala Glu Ile Arg Gln
245 250 255
Gln Ile Pro Ile Leu Lys Gln Lys Arg Ala Asp Leu Tyr Thr Val Glu
260 265 270
Ser Lys Lys Pro
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<212> PRT
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<400> 3

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Glu	Ala	Ala	Gly	Arg	Arg	Ala	Cys	Met	Val	Phe	Leu	Pro	Glu	Ala	Phe
		35					40					45			
Asp	Tyr	Ile	Gly	Gly	Ser	Ile	Glu	Glu	Thr	Leu	Ser	Leu	Ala	Glu	Ser
	50					55					60				
Leu	His	Gly	Asp	Thr	Ile	Gln	Arg	Tyr	Thr	Gln	Leu	Ala	Arg	Glu	Cys
65					70					75				80	
Gly	Leu	Trp	Leu	Ser	Leu	Gly	Gly	Phe	His	Glu	Lys	Gly	Pro	Asn	Trp
			85						90					95	
Asp	Thr	Asp	Gln	Arg	Ile	Ser	Asn	Ser	His	Val	Val	Val	Asp	Asn	Thr
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Gly	His	Ile	Val	Ser	Val	Tyr	Arg	Lys	Ala	His	Leu	Phe	Asp	Val	Asp
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Leu	Gln	Asn	Gly	Val	Ser	Leu	Arg	Glu	Ser	Ser	Ser	Thr	Leu	Pro	Gly
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Ala	Glu	Leu	Ile	Arg	Pro	Ile	Thr	Ser	Pro	Ala	Gly	Lys	Ile	Gly	Leu
145					150					155					160
Gly	Val	Cys	Tyr	Asp	Leu	Arg	Phe	Pro	Glu	Phe	Ser	Leu	Ala	Leu	Ala
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Gln	Gln	Gly	Ala	Glu	Leu	Leu	Thr	Tyr	Pro	Ser	Ala	Phe	Thr	Leu	Thr
			180					185					190		
Thr	Gly	Leu	Ala	His	Trp	Glu	Val	Leu	Leu	Arg	Ala	Arg	Ala	Ile	Glu
		195					200					205			
Thr	Gln	Cys	Tyr	Val	Val	Ala	Ala	Gln	Thr	Asp	Arg	His	Asn	Glu	
	210					215				220					
Lys	Arg	Thr	Ser	Tyr	Gly	His	Ala	Met	Val	Val	Asp	Pro	Trp	Gly	Leu
225					230					235				240	
Val	Ile	Gly	Gln	Cys	Gln	Glu	Gly	Thr	Gly	Ile	Cys	Tyr	Ala	Glu	Ile
			245						250					255	
Asp	Ile	Pro	Tyr	Met	Glu	Arg	Val	Arg	Arg	Asp	Met	Pro	Val	Trp	Arg
			260					265					270		
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<210> 4
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 <212> PRT
 <213> S. cerevisiae

<400> 4

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			20					25					30		
Ala	Ile	Gln	Lys	Lys	Ala	Asp	Val	Val	Phe	Leu	Pro	Glu	Ala	Ser	Asp
		35					40					45			
Tyr	Leu	Ser	Gln	Asn	Pro	Leu	His	Ser	Arg	Tyr	Leu	Ala	Gln	Lys	Ser
	50					55					60				

Pro Lys Phe Ile Arg Gln Leu Gln Ser Ser Ile Thr Asp Leu Val Arg
 65 70 75 80
 Asp Asn Ser Arg Asn Ile Asp Val Ser Ile Gly Val His Leu Pro Pro
 85 90 95
 Ser Glu Gln Asp Leu Leu Glu Gly Asn Asp Arg Val Arg Asn Val Leu
 100 105 110
 Leu Tyr Ile Asp His Glu Gly Lys Ile Leu Gln Glu Tyr Gln Lys Leu
 115 120 125
 His Leu Phe Asp Val Asp Val Pro Asn Gly Pro Ile Leu Lys Glu Ser
 130 135 140
 Lys Ser Val Gln Pro Gly Lys Ala Ile Pro Asp Ile Ile Glu Ser Pro
 145 150 155 160
 Leu Gly Lys Leu Gly Ser Ala Ile Cys Tyr Asp Ile Arg Phe Pro Glu
 165 170 175
 Phe Ser Leu Lys Leu Arg Ser Met Gly Ala Glu Ile Leu Cys Phe Pro
 180 185 190
 Ser Ala Phe Thr Ile Lys Thr Gly Glu Ala His Trp Glu Leu Leu Gly
 195 200 205
 Arg Ala Arg Ala Val Asp Thr Gln Cys Tyr Val Leu Met Pro Gly Gln
 210 215 220
 Val Gly Met His Asp Leu Ser Asp Pro Glu Trp Glu Lys Gln Ser His
 225 230 235 240
 Met Ser Ala Leu Glu Lys Ser Ser Arg Arg Glu Ser Trp Gly His Ser
 245 250 255
 Met Val Ile Asp Pro Trp Gly Lys Ile Ile Ala His Ala Asp Pro Ser
 260 265 270
 Thr Val Gly Pro Gln Leu Ile Leu Ala Asp Leu Asp Arg Glu Leu Leu
 275 280 285
 Gln Glu Ile Arg Asn Lys Met Pro Leu Trp Asn Gln Arg Arg Asp Asp
 290 295 300
 Leu Phe His
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<210> 5
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 <212> PRT
 <213> S. cerevisiae

<400> 5
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 35 40 45
 Val Val Leu Pro Glu Cys Phe Asn Ser Pro Tyr Ser Thr Asp Gln Phe
 50 55 60
 Arg Lys Tyr Ser Glu Val Ile Asn Pro Lys Glu Pro Ser Thr Ser Val
 65 70 75 80
 Gln Phe Leu Ser Asn Leu Ala Asn Lys Phe Lys Ile Ile Leu Val Gly
 85 90 95
 Gly Thr Ile Pro Glu Leu Asp Pro Lys Thr Asp Lys Ile Tyr Asn Thr
 100 105 110
 Ser Ile Ile Phe Asn Glu Asp Gly Lys Leu Ile Asp Lys His Arg Lys
 115 120 125

Val	His	Leu	Phe	Asp	Val	Asp	Ile	Pro	Asn	Gly	Ile	Ser	Phe	His	Glu
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Ser	Glu	Thr	Leu	Ser	Pro	Gly	Glu	Lys	Ser	Thr	Thr	Ile	Asp	Thr	Lys
145					150					155					160
Tyr	Gly	Lys	Phe	Gly	Val	Gly	Ile	Cys	Tyr	Asp	Met	Arg	Phe	Pro	Glu
				165					170					175	
Leu	Ala	Met	Leu	Ser	Ala	Arg	Lys	Gly	Ala	Phe	Ala	Met	Ile	Tyr	Pro
			180					185					190		
Ser	Ala	Phe	Asn	Thr	Val	Thr	Gly	Pro	Leu	His	Trp	His	Leu	Leu	Ala
		195					200					205			
Arg	Ser	Arg	Ala	Val	Asp	Asn	Gln	Val	Tyr	Val	Met	Leu	Cys	Ser	Pro
		210				215					220				
Ala	Arg	Asn	Leu	Gln	Ser	Ser	Tyr	His	Ala	Tyr	Gly	His	Ser	Ile	Val
225					230					235					240
Val	Asp	Pro	Arg	Gly	Lys	Ile	Val	Ala	Glu	Ala	Gly	Glu	Gly	Glu	Glu
				245					250					255	
Ile	Ile	Tyr	Ala	Glu	Leu	Asp	Pro	Glu	Val	Ile	Glu	Ser	Phe	Arg	Gln
			260					265					270		
Ala	Val	Pro	Leu	Thr	Lys	Gln	Arg	Arg	Phe	Asp	Val	Tyr	Ser	Asp	Val
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Asn	Ala	His													
		290													

<210> 6
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 <212> PRT
 <213> S. pombe

<400> 6															
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			20					25					30		
Gly	Ala	Lys	Cys	Ile	Phe	Phe	Pro	Glu	Ala	Ser	Asp	Phe	Ile	Ala	His
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Asn	Ser	Asp	Glu	Ala	Ile	Glu	Leu	Thr	Asn	His	Pro	Asp	Cys	Ser	Lys
			50			55					60				
Phe	Ile	Arg	Asp	Val	Arg	Glu	Ser	Ala	Thr	Lys	His	Ser	Ile	Phe	Val
65					70					75				80	
Asn	Ile	Cys	Val	His	Glu	Pro	Ser	Lys	Val	Lys	Asn	Lys	Leu	Leu	Asn
				85					90					95	
Ser	Ser	Leu	Phe	Ile	Glu	Pro	Leu	His	Gly	Glu	Ile	Ile	Ser	Arg	Tyr
			100					105					110		
Ser	Lys	Ala	His	Leu	Phe	Asp	Val	Glu	Ile	Lys	Asn	Gly	Pro	Thr	Leu
			115				120					125			
Lys	Glu	Ser	Asn	Thr	Thr	Leu	Arg	Gly	Glu	Ala	Ile	Leu	Pro	Pro	Cys
			130			135					140				
Lys	Thr	Pro	Leu	Gly	Lys	Val	Gly	Ser	Ala	Ile	Cys	Phe	Asp	Ile	Arg
145					150					155					160
Phe	Pro	Glu	Gln	Ala	Ile	Lys	Leu	Arg	Asn	Met	Gly	Ala	His	Ile	Ile
				165					170					175	
Thr	Tyr	Pro	Ser	Ala	Phe	Thr	Glu	Lys	Thr	Gly	Ala	Ala	His	Trp	Glu
			180					185					190		
Val	Leu	Leu	Arg	Ala	Arg	Ala	Leu	Asp	Ser	Gln	Cys	Tyr	Val	Ile	Ala
		195					200					205			

Pro	Ala	Gln	Gly	Gly	Lys	His	Asn	Glu	Lys	Arg	Ala	Ser	Tyr	Gly	His
	210					215					220				
Ser	Met	Ile	Val	Asp	Pro	Trp	Gly	Thr	Val	Ile	Ala	Gln	Tyr	Ser	Asp
225					230					235					240
Ile	Ser	Ser	Pro	Asn	Gly	Leu	Ile	Phe	Ala	Asp	Leu	Asp	Leu	Asn	Leu
				245					250					255	
Val	Asp	His	Val	Arg	Thr	Tyr	Ile	Pro	Leu	Leu	Arg	Arg	Asn	Asp	Leu
			260					265					270		
Tyr	Pro	Thr	Ile												
	275														

<210> 7
 <211> 322
 <212> PRT
 <213> S. pombe

<400> 7

Met	Asn	Ser	Lys	Phe	Phe	Gly	Leu	Val	Gln	Lys	Gly	Thr	Arg	Ser	Phe
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			20					25					30		
Ala	Ser	Ser	Leu	Val	Pro	Lys	Asp	Phe	Arg	Ala	Phe	Arg	Ile	Gly	Leu
		35					40					45			
Val	Gln	Leu	Ala	Asn	Thr	Lys	Asp	Lys	Ser	Glu	Asn	Leu	Gln	Leu	Ala
	50					55					60				
Arg	Leu	Lys	Val	Leu	Glu	Ala	Ala	Lys	Asn	Gly	Ser	Asn	Val	Ile	Val
65					70					75				80	
Leu	Pro	Glu	Ile	Phe	Asn	Ser	Pro	Tyr	Gly	Thr	Gly	Tyr	Phe	Asn	Gln
				85					90					95	
Tyr	Ala	Glu	Pro	Ile	Glu	Glu	Ser	Ser	Pro	Ser	Tyr	Gln	Ala	Leu	Ser
			100					105					110		
Ser	Met	Ala	Lys	Asp	Thr	Lys	Thr	Tyr	Leu	Phe	Gly	Gly	Ser	Ile	Pro
		115					120					125			
Glu	Arg	Lys	Asp	Gly	Lys	Leu	Tyr	Asn	Thr	Ala	Met	Val	Phe	Asp	Pro
	130					135					140				
Ser	Gly	Lys	Leu	Ile	Ala	Val	His	Arg	Lys	Ile	His	Leu	Phe	Asp	Ile
145					150					155					160
Asp	Ile	Pro	Gly	Gly	Val	Ser	Phe	Arg	Glu	Ser	Asp	Ser	Leu	Ser	Pro
				165					170					175	
Gly	Asp	Ala	Met	Thr	Met	Val	Asp	Thr	Glu	Tyr	Gly	Lys	Phe	Gly	Leu
			180					185					190		
Gly	Ile	Cys	Tyr	Asp	Ile	Arg	Phe	Pro	Glu	Leu	Ala	Met	Ile	Ala	Ala
		195					200					205			
Arg	Asn	Gly	Cys	Ser	Val	Met	Ile	Tyr	Pro	Gly	Ala	Phe	Asn	Leu	Ser
	210					215					220				
Thr	Gly	Pro	Leu	His	Trp	Glu	Leu	Leu	Ala	Arg	Ala	Arg	Ala	Val	Asp
225					230					235					240
Asn	Glu	Met	Phe	Val	Ala	Cys	Cys	Ala	Pro	Ala	Arg	Asp	Met	Asn	Ala
				245					250					255	
Asp	Tyr	His	Ser	Trp	Gly	His	Ser	Thr	Val	Val	Asp	Pro	Phe	Gly	Lys
			260					265					270		
Val	Ile	Ala	Thr	Thr	Asp	Glu	Lys	Pro	Ser	Ile	Val	Tyr	Ala	Asp	Ile
		275					280					285			
Asp	Pro	Ser	Val	Met	Ser	Thr	Ala	Arg	Asn	Ser	Val	Pro	Ile	Tyr	Thr
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Gln Arg Arg Phe Asp Val Tyr Ser Glu Val Leu Pro Ala Leu Lys Lys
 305 310 315 320
 Glu Glu

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 <212> DNA
 <213> Homo sapien

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 caaggagcca aaatagtttc ttgtccggaa tgctttaatt ctccatatgg agcgaaatat 180
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 aacctagggt ctctattgag atgagaaaagc ctcattatgc tgacattttc cacgccacat 1020
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 <212> DNA
 <213> mouse

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 aattctccat atggaacaac ctacttttcc gactatgcag agaagattcc tggagagtcc 240
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 tttcaagaat ctaaaacatt gagccctggg gatagtttct ccacatttga tacgccttac 480
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 gccactggg agctgcttca gcgagcccg gctgttgata atcaggtgta tgtggctaca 660
 gcctctcctg ctggggatga caaagcctcg tatgtggcct ggggacacag cactgttgtg 720
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 atagacctga agaagctggc tgaaattcgc cagcaaatcc ccattttaaa acagaaaacga 840

Ala	Ser	Ala	Ile	His	Val	Pro	Gly	Pro	Glu	Val	Ala	Arg	Leu	Ala	Asp	
			100					105					110			
Val	Ala	Arg	Lys	Asn	His	Val	Tyr	Leu	Val	Met	Gly	Ala	Ile	Glu	Lys	
		115					120					125				
Glu	Gly	Tyr	Thr	Leu	Tyr	Cys	Thr	Val	Leu	Phe	Phe	Ser	Pro	Gln	Gly	
	130					135					140					
Gln	Phe	Leu	Gly	Lys	His	Arg	Lys	Leu	Met	Pro	Thr	Ser	Leu	Glu	Arg	
145					150					155					160	
Cys	Ile	Trp	Gly	Gln	Gly	Asp	Gly	Ser	Thr	Ile	Pro	Val	Tyr	Asp	Thr	
			165						170					175		
Pro	Ile	Gly	Lys	Leu	Gly	Ala	Ala	Ile	Cys	Trp	Glu	Asn	Arg	Met	Pro	
			180					185					190			
Leu	Tyr	Arg	Thr	Ala	Leu	Tyr	Ala	Lys	Gly	Ile	Glu	Leu	Tyr	Cys	Ala	
	195						200					205				
Pro	Thr	Ala	Asp	Gly	Ser	Lys	Glu	Trp	Gln	Ser	Ser	Met	Leu	His	Ile	
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Ala	Ile	Glu	Gly	Gly	Cys	Phe	Val	Leu	Ser	Ala	Cys	Gln	Phe	Cys	Gln	
225					230					235					240	
Arg	Lys	His	Phe	Pro	Asp	His	Pro	Asp	Tyr	Leu	Phe	Thr	Asp	Trp	Tyr	
				245					250					255		
Asp	Asp	Lys	Glu	His	Asp	Ser	Ile	Val	Ser	Gln	Gly	Gly	Ser	Val	Ile	
		260						265					270			
Ile	Ser	Pro	Leu	Gly	Gln	Val	Leu	Ala	Gly	Pro	Asn	Phe	Glu	Ser	Glu	
	275						280					285				
Gly	Leu	Val	Thr	Ala	Asp	Ile	Asp	Leu	Gly	Asp	Ile	Ala	Arg	Ala	Lys	
	290					295				300						
Leu	Tyr	Phe	Asp	Ser	Val	Gly	His	Tyr	Ser	Arg	Pro	Asp	Val	Leu	His	
305					310					315					320	
Leu	Thr	Val	Asn	Glu	His	Pro	Arg	Lys	Ser	Val	Thr	Phe	Val	Thr	Lys	
			325						330					335		
Val	Glu	Lys	Ala	Glu	Asp	Asp	Ser	Asn	Lys							
			340					345								